

## Andreas Colliander

Dr. Andreas Colliander is a Scientist in the Water and Carbon Cycles Group of the Science Division. His primary field of research is the development of microwave remote sensing techniques. He is currently focused on NASA's SMAP (Soil Moisture Active and Passive) mission as a member of the science algorithm development team. His work addresses performance and reliability of soil moisture retrieval algorithms utilizing active and passive microwave measurements, and the science product calibration and validation.

In the past Dr. Colliander's research activities have included microwave instrument development related to the European Space Agency's SMOS (Soil Moisture and Ocean Salinity) mission, studies on synthetic aperture interferometric radiometry concepts, and investigations of polarimetric radiometry. Dr. Colliander is a Senior Member of the IEEE, and serves as a co-lead of the Microwave Radiometer Working Group of the IEEE Geoscience and Remote Sensing Society.



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## Education

- Ph.D., Electrical Engineering, Helsinki University of Technology (2007)
  - M.S., Electrical Engineering, Helsinki University of Technology (2002)
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## Research interests

Microwave remote sensing techniques, especially for hydrology applications.

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## Professional Experience

- Jet Propulsion Laboratory, Scientist, Water and Carbon Cycles Group (2008-present)
  - European Space Agency, Postdoctoral Research Fellow, European Space and Technology Research Centre (2007-2008)
  - Helsinki University of Technology, Research Scientist and Project Manager, Laboratory of Space Technology (2001-2007)
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## Selected Publications

1. **Colliander, A.**, Corbella, I., Torres, F., "Correlation Denormalization in Interferometric or Polarimetric Radiometers: A Unified Approach", IEEE Transactions on Geoscience and Remote Sensing, vol. 47, no. 2, pp. 561-568, February 2009.
2. Brown, M., Corbella, I., Torres, F., **Colliander, A.**, "SMOS Calibration", IEEE Transactions on Geoscience and Remote Sensing, vol. 46, no. 3, pp. 646-658, March 2008.
3. **Colliander, A.**, Ylä-Oijala, P., "Electromagnetic Scattering from Rough Surface Using Single Integral Equation and Adaptive Integral Method", IEEE Transactions on Antennas and Propagation, vol. 55, no. 12, pp. 3639-3646, December 2007

4. Lemmetyinen, J., Uusitalo, J., Kainulainen, J., Rautiainen, K., Fabritius, N., Levander, M., Kangas, V., Greus, H., Pihlflyckt, J., Kontu, A., Kemppainen, S., **Colliander, A.**, Hallikainen, M.T., Lahtinen, J., "SMOS Calibration Subsystem", IEEE Transactions on Geoscience and Remote Sensing, vol. 45, no. 11, pp. 3691-3700, November 2007
5. **Colliander, A.**, Ruokokoski, L., Suomela, J., Veijola, K., Kettunen, J., Kangas, V., Aalto, A., Levander, A., Greus, H., Hallikainen, M., Lahtinen, J., "Development and Calibration of SMOS Reference Radiometer", IEEE Transactions on Geoscience and Remote Sensing, vol. 45, no. 7, pp. 1967-1977, July 2007
6. **Colliander, A.**, Lahtinen, J., Tauriainen, S., Pihlflyckt, J., Lemmetyinen, J., Hallikainen, M., "Sensitivity of Airborne 36.5-GHz Polarimetric Radiometer's Wind-Speed Measurement to Incidence Angle", IEEE Transactions on Geoscience and Remote Sensing, vol. 45, no. 7, pp. 2122-2129, July 2007.
7. **Colliander, A.**, Kettunen, J., Hallikainen, M. T., "Calibration of End-to-end Phase Imbalance of Polarimetric Radiometers", IEEE Transactions on Geoscience and Remote Sensing, vol. 44, no. 10, pp. 2635-2641, Oct. 2006.
8. Corbella, I., Torres, F., Camps, A., Duffo, N., Vall-llossera, M., Rautiainen, K., Martín-Neira, M., **Colliander, A.**, "Analysis of Correlation and Total Power Radiometer Front-Ends Using Noise Waves", IEEE Transactions on Geoscience and Remote Sensing, vol. 43, no. 11, pp. 2452-2459, Nov 2005.
9. **Colliander, A.**, Tauriainen, S., Auer, T., Kainulainen, J., Uusitalo, J., Toikka, M., Hallikainen, M., "MIRAS Reference Radiometer: A Fully Polarimetric Noise Injection Radiometer", IEEE Transactions on Geoscience and Remote Sensing, vol. 43, no. 5, pp. 1135-1143, May 2005.
10. Corbella, I., Torres, F., Camps, A., **Colliander, A.**, Martín-Neira, M., Ribó, S., Rautiainen, K., Duffo, N., Vall-llossera, M., "MIRAS End-to-End Calibration. Application to SMOS L1 Processor", IEEE Transactions on Geoscience and Remote Sensing, vol. 43, no. 5, pp. 1126-1134, May 2005.